

What is Claimed Is:

1 <sup>Sub</sup> 2. 1. A method for receiving an optical double sideband signal over an optical  
 2 fiber system, comprising the steps of;  
 3 splitting the received optical double sideband signal into an upper sideband signal and  
 4 a lower sideband signal;  
 5 photodetecting said upper sideband;  
 6 photodetecting said lower sideband; and  
 7 combining said photodetected upper sideband signal with said photodetected lower  
 8 sideband signal.

1 ~~2. The method according to claim 1, further comprising the steps of:~~  
 2 ~~dispersion compensating said photodetected upper sideband signal; and~~  
 3 ~~dispersion compensating said photodetected lower sideband signal.~~

1 3. The method according to claim 1, further comprising the steps of:  
 2 equalizing said photodetected upper sideband signal; and  
 3 ~~equalizing said photodetected lower sideband signal.~~

1 <sup>Sub</sup> 4. The method according to claim 2, further comprising the steps of:  
 2 equalizing said dispersion compensated upper sideband signal; and  
 3 equalizing said dispersion compensated lower sideband signal.

4 5. The method according to claim 1, wherein said combining step is performed  
 5 using a diversity combiner.

1           6.     The method according to claim 1, wherein said optical double sideband signal  
2 is amplitude modulated.

1           7.     The method according to claim 2, wherein said dispersion compensating step  
2 of said photodetected upper sideband and dispersion compensating step of said photodetected  
3 lower sideband is performed concurrently.

1           8.     The method according to claim 1, wherein said photodetection step of said  
2 upper sideband and said photodetection step of said lower sideband is performed  
3 concurrently.

1           9.     The method according to claim 3, wherein said equalization step of said  
2 photodetected upper sideband and said equalization step of said photodetected lower  
3 sideband is performed concurrently.

1           10.    The method according to claim 3, wherein the steps of photodetecting and  
2 equalizing of said upper sideband and the steps of photodetecting and equalizing said lower  
3 sideband are performed serially.

1           11.    The method according to claim 3, wherein a plurality of the photodetecting  
2 and equalizing steps of said upper sideband and a plurality of the photodetecting and  
3 equalizing steps of said lower sideband are performed serially.

1           12.    The method according to claim 3, wherein a plurality of the photodetecting  
2 and equalizing steps of said upper sideband and a plurality of the photodetecting and  
3 equalizing steps of said lower sideband are performed concurrently.

1           13.    The method according to claim 4, wherein the photodetecting, dispersion  
2           compensating and equalizing steps of said upper sideband and the photodetecting, dispersion  
3           compensating and equalizing steps of said lower sideband are performed concurrently.

1           14.    The method according to claim 1, wherein said combining step is a  
2           summation.

1           15.    The method according to claim 1, wherein said combining step is a weighted  
2           summation.

1           16.    The method according to claim 1, wherein said combining step further  
2           comprises the steps of:

3                 delaying one sideband signal relative to the other sideband signal; and  
4                 summing the two signals.

1           17.    The method according to claim 1, wherein said combination step is selection  
2           of better output.

1           18.    The method according to claim 1, wherein said combination step is based on  
2           link properties.

1           19.    The method according to claim 1, further comprising the step of filtering the  
2           optical signal.

1           20.    The method according to claim 19, wherein said filtering step is performed  
2           using a fiber Bragg grating (FBG).

1           21.    The method according to claim 19, wherein said filtering step is performed  
2 using a thin-film filter.

1           22.    A method for generating transmitting, and receiving an optical double  
2 sideband signal, comprising the steps of:

3           generating an optical carrier;  
4           sending said optical carrier to a modulator;  
5           concurrently encoding an input data signal to produce an encoded data signal;  
6           intensity modulating said fine encoded data signal to produce an optical double  
7 sideband signal;  
8           transmitting said optical double sideband signal over a fiber link;  
9           splitting the received optical double sideband signal into an upper sideband signal and  
10 a lower sideband signal;  
11           photodetecting said upper sideband;  
12           photodetecting said lower sideband; and  
13           combining said photodetected upper sideband signal with said photodetected lower  
14 sideband signal.

1           23.    A method of receiving an optical double sideband signal, comprising the steps  
2 of:  
3           receiving an optical double sideband signal;  
4           splitting said received optical double sideband signal using a splitter into two  
5 branches;

6 concurrently processing the resulting two branches by applying a filter to each branch  
7 to produce a filtered upper sideband signal and a filtered lower sideband signal;

8 concurrently applying a photodetector to said filtered upper sideband signal and to  
9 said filtered lower sideband signal to produce a photodetected upper sideband signal and a  
10 photodetected lower sideband signal; and

11 combining said photodetected upper sideband signal and said photodetected lower  
12 sideband signal using a combiner to produce an output signal.

1 24. The method according to claim 23, wherein said combining step is a diversity  
2 combiner.

1 25. The method according to claim 23, wherein said splitting step transmits an  
2 equal optical power to each branch.

1 26. The method according to claim 25, wherein said splitting step is performed  
2 using a 3dB splitter.

1 27. A method of generating, transmitting and receiving an optical double sideband  
2 signal comprising the steps of:

3 generating an optical carrier,

4 sending said optical carrier to a modulator;

5 concurrently encoding an input data signal to produce a encoded data signal;

6 intensity modulating said line encoded data signal to produce an optical double  
7 sideband signal;

8 transmitting said optical double sideband signal over a fiber link;

9 receiving said optical double sideband signal;  
10 splitting said received optical double sideband signal using a splitter into two  
11 branches;  
12 concurrently processing the resulting two branches by applying a filter to each branch  
13 to produce a filtered upper sideband signal and a filtered lower sideband signal;  
14 concurrently applying a photodetector to said filtered upper sideband signal and to  
15 said filtered lower sideband signal to produce a photodetected upper sideband signal and a  
16 photodetected lower sideband signal; and  
17 combining said photodetected upper sideband signal and said photodetected lower  
18 sideband signal using a combiner to produce an output signal.

1 28. The method according to claim 22, wherein said combining step performed  
2 using a diversity combiner.

1 29. The method according to claim 22, wherein said splitting step is performed  
2 using a 3 dB splitter.